

519 Prediction of wool fibre diameter from protein and metabolisable energy digestibility coefficients in crossbred sheep. A. E. O. Malau-Aduli*, R. E. Walker, and W. C. Bignell, *University of Tasmania, Hobart, Tasmania 7001, Australia.*

Our objective in this study was to investigate the interactions between sire breed and supplement on digestibility and to ascertain its accuracy in predicting wool fibre diameter. Forty first-cross Merino weaner sheep sired by Texel, Coopworth, White Suffolk, East-Friesian and Dorset sires with initial BW range of 22.9 and 31.3 kg (average of 26.8 ± 3.2 kg) were randomly assigned to four treatment groups in a $5 \times 2 \times 2 \times 2$ factorial experimental design representing 5 sire breeds, 2 supplementary feeds (canola and lupins), 2 feeding levels (1 and 2% of bodyweight) and 2 sexes (ewes and wethers). The feeding trial lasted for six weeks with an initial 3-week adjustment period and the last 7 days for faecal collection. Factorial ANOVA with orthogonal contrasts in SAS was used for statistical analysis to test for the interactions between sire breed and supplement on digestibility and wool fibre diameter. Our results demonstrated that sire breed \times level of feeding interactions significantly influenced digestibility ($P < 0.01$) whereby Coopworth-sired sheep supplemented at 1% of their body weight recorded the highest ME and N digestibility of 54% and 67% compared to 42% and 62% respectively, in their counterparts fed at 2% of body weight. There was a highly significant ($P < 0.01$) effect of type of supplement \times level of feeding interaction on wool fibre diameter at the end of the trial because sheep fed canola supplements at 1% of body weight had finer wool (22.1 microns) than their 2%-fed counterparts (25.4 microns). Regression of wool fibre diameter on digestibility revealed very poor prediction accuracy ($R^2 = 0.0087-0.169$). We concluded that sire breed variation in digestibility is unlikely to be a useful predictor of genetic merit for wool fibre diameter in first cross sheep under the same management.

Key Words: digestibility, wool, fibre diameter

520 Wool quality and growth traits of Tasmanian pasture-fed crossbred lambs and relationships with plasma metabolites. A. E. O. Malau-Aduli*, C. F. Ranson, and C. W. Bignell, *University of Tasmania, Hobart, Tasmania 7001, Australia.*

Wool quality, growth and plasma metabolite traits of 500 F₁ progeny from Merino dams sired by 5 ram breeds were investigated to study the influences of sire breed, sex and their interactions with plasma metabolites aimed at dual-purpose crossbreeding options. Coopworth, Texel and White Suffolk sired progeny had significantly ($P<0.05$) heavier weaning weights (WWT) and average daily gains (ADG) than those sired by Dorset or East-Friesian rams. Coopworth-sired sheep had the highest WWT ($31.3\pm1.7\text{Kg}$) and East-Friesian sired sheep the lowest ($22.9\pm3.1\text{Kg}$) with ADG ranging from 0.15kg/day in East-Friesian to 0.23 Kg/day in Texel and White Suffolk sire breeds. Highly significant ($P<0.01$) sex by sire breed interaction were evident; Coopworth-sired ewe lambs had the highest WWT and ADG (34Kg, 0.27 Kg/day) and Dorset-sired ewe lambs the least (22kg, 0.15 Kg/day). Greasy fleece weight ranged from a minimum of 964g to a maximum of 1303g in Dorset and Coopworth-sired lambs respectively, with Coopworth and Texel sire breeds having significantly heavier ($P<0.05$) fleece weights than either Dorset, White Suffolk or East-Friesian. Texel-sired sheep had significantly larger ($P<0.05$) micron fibre diameter ($23.4\mu\text{m}$) than the $21\mu\text{m}$ recorded in White Suffolks and East-Friesians. There were also highly significant differences ($P<0.01$) between sire breeds in staple length (range 50-68mm) and staple strength (range 39-52Nktex), with males having finer fibre diameter (21 vs $23\mu\text{m}$) and shorter staple length (55 vs 60mm). Regardless of sire breed or gender, blood plasma metabolites were well within the normal range. A strong, positive and significant phenotypic correlation of 0.72 existed between marking and weaning weights. There were no significant correlations between the wool quality and growth traits, essentially implying that producers can select for finer wool without compromising growth. Coopworth x Merino first cross was the overall best performing sheep breed studied because of its heavier liveweight, faster daily gain, heavy fleece weight and a comparatively lower micron fibre diameter than the other crossbreds.

Key Words: Tasmanian crossbreds, wool quality, plasma metabolites